CITY OF EMMETT (PWS 3230012)
SOURCE WATER ASSESSMENT FINAL REPORT

September 26, 2000

State of Idaho
Department of Environmental Quality

Executive Summary

Under the Safe Drinking Water Act Amendments of 1996, all states are required by the U.S. Environmental Protection Agency to assess every source of public drinking water for its relative sensitivity to contaminants regulated by the Act. This assessment is based on a land use inventory of the designated assessment area and sensitivity factors associated with the wells and aquifer characteristics.

This report, *Source Water Assessment for City of Emmett, Idaho*, describes the public drinking water system, the boundaries of the zones of water contribution, and the associated potential contaminant sources located within these boundaries. This assessment should be used as a planning tool, taken into account with local knowledge and concerns, to develop and implement appropriate protection measures for this source. **The results should not be used as an absolute measure of risk and they should not be used to undermine public confidence in the water system.**

The City of Emmett drinking water system consists of four wells, of which Wells #6 and #8 account for the majority of the use from 1995 to 1999. Well #5 is the backup well. Well #9 was recently installed and has not come on line as of yet. Due to a high rating in hydrologic sensitivity and moderate rating for system construction, Well #5 has a high susceptibility to inorganic contamination, volatile organic contamination, and synthetic organic contamination. Well #6 rates high for inorganic contamination and moderate for all other categories. Well #8 has a moderate rating for all classes of contaminants. Well #9 was drilled deeper and constructed to meet current standards, which reduced the overall susceptibility to moderate for all categories. From 1992 to 1998, total coliform bacteria were detected at the high school, the cemetery, and the E. Locust fire hydrant, but never at the wells. Nor have any other categories of contamination have been recorded in the well water.

This assessment should be used as a basis for determining appropriate new protection measures or re-evaluating existing protection efforts. No matter what ranking a source receives, protection is always important. Whether the source is currently located in a "pristine" area or an area with numerous industrial and/or agricultural land uses that require education and surveillance, the way to ensure good water quality in the future is to act now to protect valuable water supply resources.

For the City of Emmett, source water protection activities should focus on implementation of practices aimed at reducing the leaching of agricultural chemicals from agricultural land within the designated source water areas. Most of the designated areas are outside the direct jurisdiction of the City of Emmett. Partnerships with state and local agencies and industry groups should be established and are critical to success. All wells should maintain sanitary survey standards regarding wellhead protection. Disinfection practices should be maintained to reduce the risk of microbial contamination. Due to the time involved with the movement of groundwater, source water protection activities should be aimed at long-term management strategies even though these strategies may not yield results in the near term. Source water protection activities for agriculture should be coordinated with the Idaho State Department of Agriculture, the Soil Conservation Commission and Gem Soil and Water Conservation District, and the Natural Resources Conservation Service.

A community with a fully developed source water protection program will incorporate many strategies. For assistance in developing protection strategies please contact the Boise Regional Office of the Idaho Department of Environmental Quality or the Idaho Rural Water Association.

SOURCE WATER ASSESSMENT FOR CITY OF EMMETT, IDAHO

Section 1. Introduction - Basis for Assessment

The following sections contain information necessary to understand how and why this assessment was conducted. **It is important to review this information to understand what the ranking of this source means.** A map showing the delineated source water assessment area and the inventory of significant potential sources of contamination identified within that area are attached. The list of significant potential contaminant source categories and their rankings used to develop the assessment also is attached.

Background

Under the Safe Drinking Water Act Amendments of 1996, all states are required by the U.S. Environmental Protection Agency (EPA) to assess every source of public drinking water for its relative susceptibility to contaminants regulated by the Safe Drinking Water Act. This assessment is based on a land use inventory of the delineated assessment area and sensitivity factors associated with the wells and aquifer characteristics.

Level of Accuracy and Purpose of the Assessment

Since there are over 2,900 public water sources in Idaho, there is limited time and resources to accomplish the assessments. All assessments must be completed by May of 2003. An in-depth, site-specific investigation of each significant potential source of contamination is not possible. **Therefore, this assessment should be used as a planning tool, taken into account with local knowledge and concerns, to develop and implement appropriate protection measures for this source. The results should <u>not be</u> used as an absolute measure of risk and they should <u>not be</u> used to undermine public confidence in the water system.**

The ultimate goal of the assessment is to provide data to local communities to develop a protection strategy for their drinking water supply system. The Idaho Department of Environmental Quality (IDEQ) recognizes that pollution prevention activities generally require less time and money to implement than treatment of a public water supply system once it has been contaminated. IDEQ encourages communities to balance resource protection with economic growth and development. The decision as to the amount and types of information necessary to develop a source water protection program should be determined by the local community based on its own needs and limitations. Wellhead or source water protection is one facet of a comprehensive growth plan, and it can complement ongoing local planning efforts.

Section 2. Conducting the Assessment

General Description of the Source Water Quality

The City of Emmett wells are community wells that serve approximately 5,205 people with 1,928 total connections. The wells are located in Gem County, at various locations in and around the City of Emmett (Figure 1). The public drinking water system for City of Emmett is comprised of four wells.

No significant water chemistry problems have been recorded in the well water. Total coliform bacteria has been detected approximately once per year for the past 8 years, though never at the wellheads. No inorganic contaminant (IOC) (i.e. nitrate) has been recorded above the Maximum Contaminant Level (MCL). Volatile organic contaminants (VOCs) and synthetic organic contaminants (SOCs) have never been detected in any of the drinking water. Though no significant water chemistry problems currently exist, the possibility of contamination from agricultural and urban uses remains high.

Defining the Zones of Contribution--Delineation

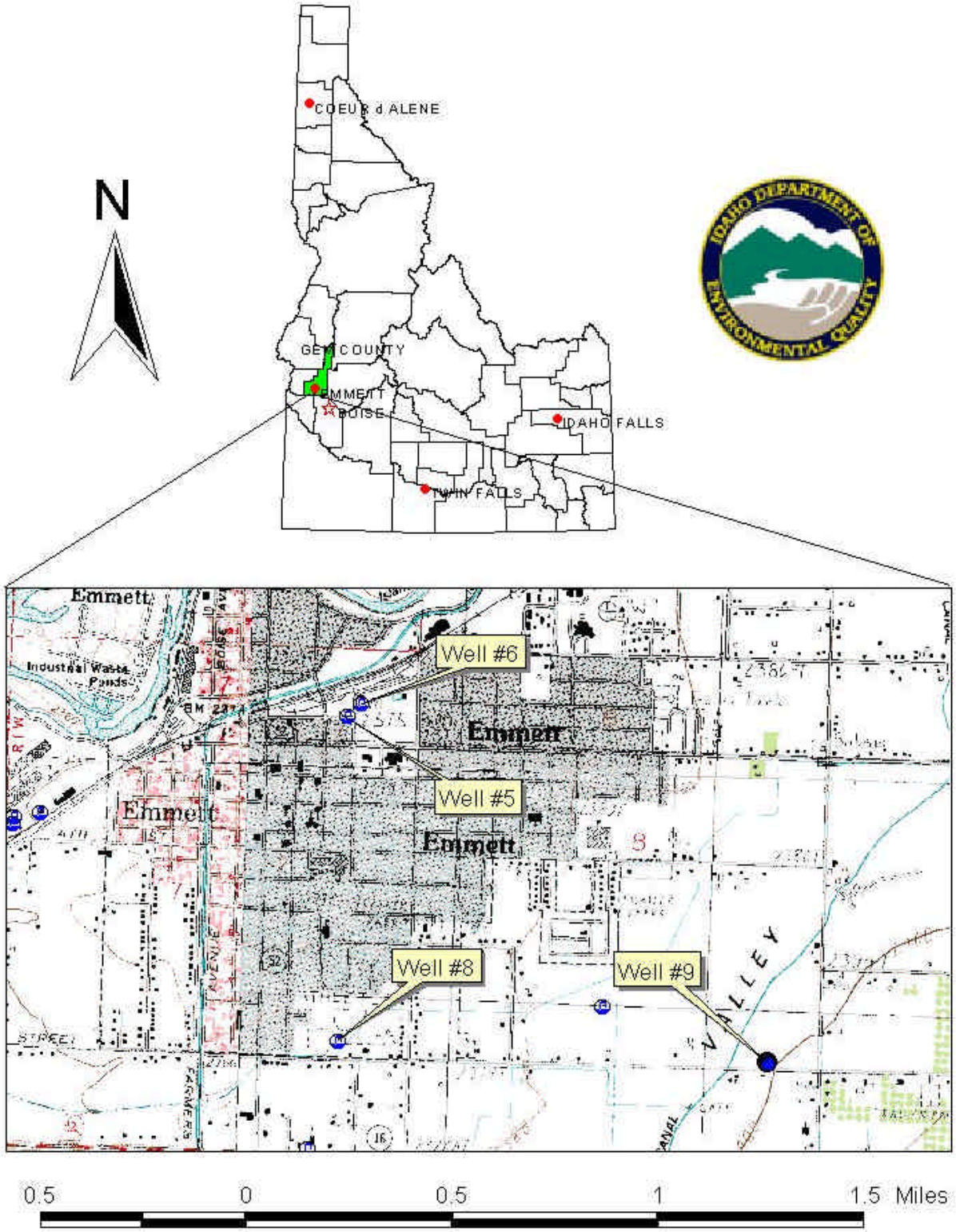
The delineation process establishes the physical area around a well that will become the focal point of the assessment. The process includes mapping the boundaries of the zone of contribution into time of travel zones (zones indicating the number of years necessary for a particle of water to reach a well) for water in the aquifer. IDEQ used a refined computer model approved by the EPA in determining the 3-year (Zone 1B), 6-year (Zone 2), and 10-year (Zone 3) time of travel for water associated with the Payette Valley aquifer in the vicinity of City of Emmett. The computer model used site specific data, assimilated by IDEQ from a variety of sources including the City of Emmett well logs for Wells #6, #8, and #9, and other local area well logs. The delineated source water assessment areas for City of Emmett Wells #5 and #6 can best be described as a corridor approximately ½mile wide and 2 ½miles long extending east-northeast through downtown Emmett to the Black Canyon Canal. The delineated source water assessment area for Well #8 extends to the east for about 1 mile and then continues up the Emmett Valley to the northeast for 1 ½miles. The delineated source water assessment area for Well #9 is a corridor ½mile wide and 2 miles long extending to the northeast beyond the Black Canyon Canal (Figures 2, 3, 4, 5). The actual data used by IDEQ in determining the source water assessment delineation areas are available upon request.

Identifying Potential Sources of Contamination

A potential source of contamination is defined as any facility or activity that stores, uses, or produces, as a product or by-product, the contaminants regulated under the Safe Drinking Water Act and has a sufficient likelihood of releasing such contaminants at levels that could pose a concern relative to drinking water sources. The goal of the inventory process is to locate and describe those facilities, land uses, and environmental conditions that are potential sources of groundwater contamination. The locations of potential sources of contamination within the delineation areas were obtained by field surveys conducted by IDEQ and from available databases.

The dominant land use outside the City of Emmett area is irrigated agriculture. Land use within the immediate area of the wellheads consists of residential, urban, and agricultural uses.

Figure 1. Geographic Location of City of Emmett Wells #5, #6, #8, and #9



It is important to understand that a release may never occur from a potential source of contamination provided they are using best management practices. Many potential sources of contamination are regulated at the federal level, state level, or both to reduce the risk of release. Therefore, when a business, facility, or property is identified as a potential contaminant source, this should not be interpreted to mean that this business, facility, or property is in violation of any local, state, or federal environmental law or regulation. What it does mean is that the potential for contamination exists due to the nature of the business, industry, or operation. There are a number of methods that water systems can use to work cooperatively with potential sources of contamination. These involve educational visits and inspections of stored materials. Many owners of such facilities may not even be aware that they are located near a public water supply well.

Contaminant Source Inventory Process

A two-phased contaminant inventory of the study area was conducted during June of 2000. The first phase involved identifying and documenting potential contaminant sources within the City of Emmett Source Water Assessment Area through the use of computer databases and Geographic Information System (GIS) maps developed by IDEQ. The second or enhanced phase of the contaminant inventory involved contacting the operator to validate the sources identified in phase one and to add any additional potential sources in the area. This task was undertaken with the assistance of Bruce Evans.

Since the delineated source water areas encompass various portions of the Emmett area, the different wells have different numbers and types of potential contaminant sources. Well #5 has 10 potential contaminant sites (see Table 1). Well #6 has 6 potential contaminant sites (see Table 2). Well #8 has 7 potential contaminant sources (see Table 3). Well #9 has 2 potential contaminant sites (see Table 4). The sources include a number of storage facilities, government facilities, and hospitals, along with a business having an above ground storage tank (AST) and one having a completed leaking underground storage tank (LUST) cleanup. Additionally, there is a Superfund Amendments and Reauthorization Act (SARA) site, a site regulated under the Resource Conservation Recovery Act (RICRIS), and a Comprehensive Environmental Response Compensation and Liability Act (CERCLA) site. The locations of these various potential contaminant sites relative to the wellheads (Figures 2, 3, 4, 5).

Table 1. City of Emmett Well #5, Potential Contaminant Inventory

SITE #	Source Description	TOT Zone (years)	Source of Information	Potential Contaminants
1	UST	0-3	Database Search	VOC, SOC
2	Ambulance Service	0-3	Database Search	VOC, SOC
3	Carpet Cleaners	0-3	Database Search	IOC, SOC
4	RCRIS	0-3	Database Search	IOC, VOC, SOC
5	SARA	0-3	Database Search	VOC, SOC
6	SARA	0-3	Database Search	IOC, SOC
7	AST	0-3	Database Search	VOC, SOC
8	Hospital	3-6	Database Search	IOC
9	Hospital	3-6	Database Search	IOC
10	Veterinarians	6-10	Database Search	IOC

IOC = inorganic chemical, VOC = volatile organic chemical, SOC = synthetic organic chemical

Figure 2. City of Emmett Well #5
Delineation and Potential Contaminant Locations

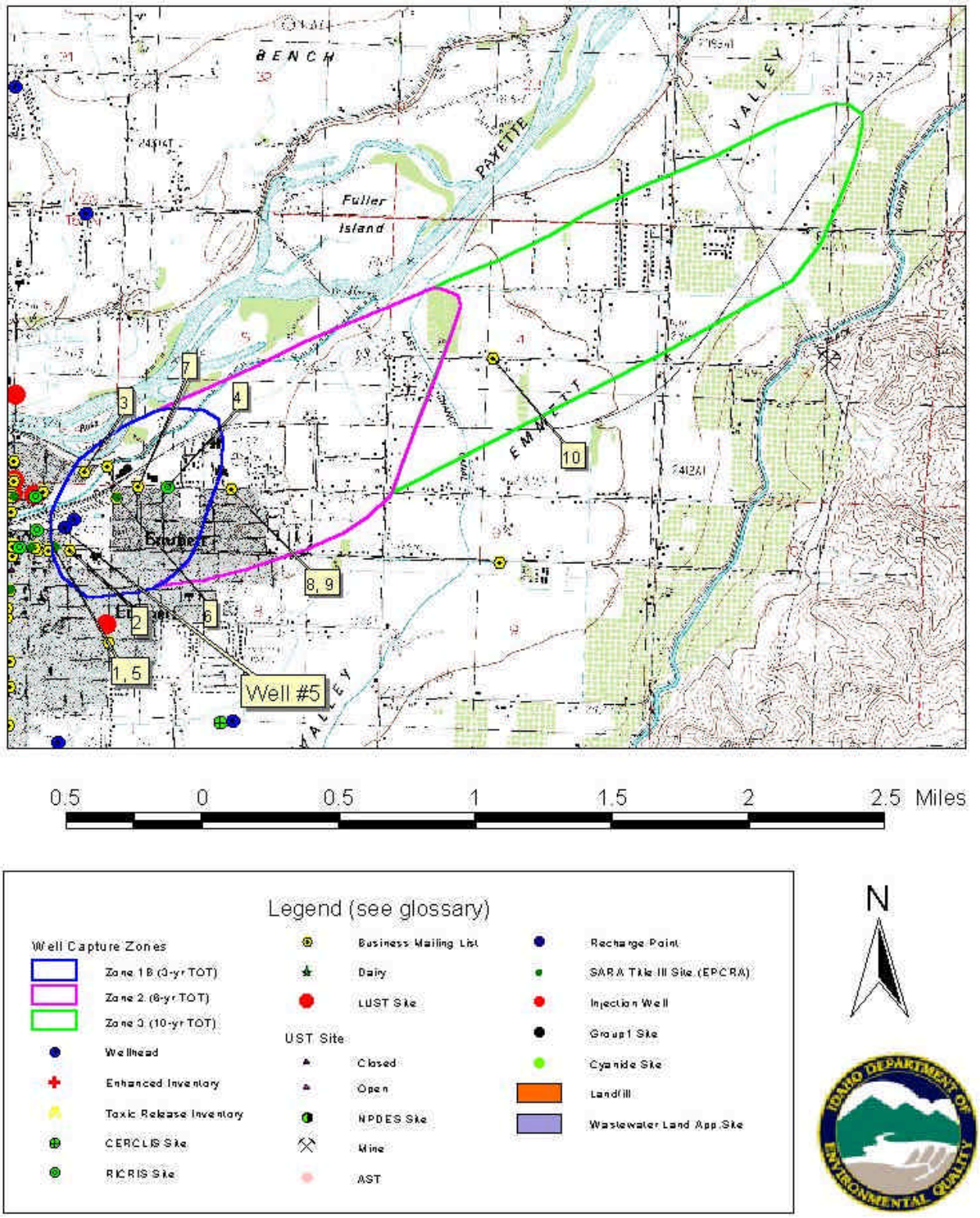


Table 2. City of Emmett Well #6, Potential Contaminant Inventory

SITE #	Source Description	TOT Zone (years)	Source of Information	Potential Contaminants
1	Hospital	0-3	Database Search	IOC
2	Hospital	0-3	Database Search	IOC
3	RICRIS	0-3	Database Search	IOC, VOC, SOC
4	SARA	0-3	Database Search	IOC, SOC
5	AST	0-3	Database Search	VOC, SOC
6	Veterinarians	3-6	Database Search	IOC

IOC = inorganic chemical, VOC = volatile organic chemical, SOC = synthetic organic chemical

Table 3. City of Emmett Well #8, Potential Contaminant Inventory

SITE #	Source Description	TOT Zone (years)	Source of Information	Potential Contaminants
1	LUST	0-3	Database Search	VOC, SOC
2	Sweeping Service	0-3	Database Search	VOC, SOC
3	State Govt-Transportation	0-3	Database Search	IOC, VOC, SOC
4	CERCLA	0-3	Database Search	IOC, VOC, SOC
5	Storage-Household & Commercial	3-6	Database Search	IOC, VOC, SOC
6	Government-Forestry	3-6	Database Search	VOC, SOC
7	Storage-Household & Commercial	6-10	Database Search	IOC, VOC, SOC

IOC = inorganic chemical, VOC = volatile organic chemical, SOC = synthetic organic chemical

Table 4. City of Emmett Well #9, Potential Contaminant Inventory

SITE #	Source Description	TOT Zone (years)	Source of Information	Potential Contaminants
1	Storage-Household & Commercial	3-6	Database Search	IOC, VOC, SOC
2	Mine-Sand and Gravel	6-10	Database Search	IOC

IOC = inorganic chemical, VOC = volatile organic chemical, SOC = synthetic organic chemical

Figure 3. City of Emmett Well #6 Delineation and Potential Contaminant Locations

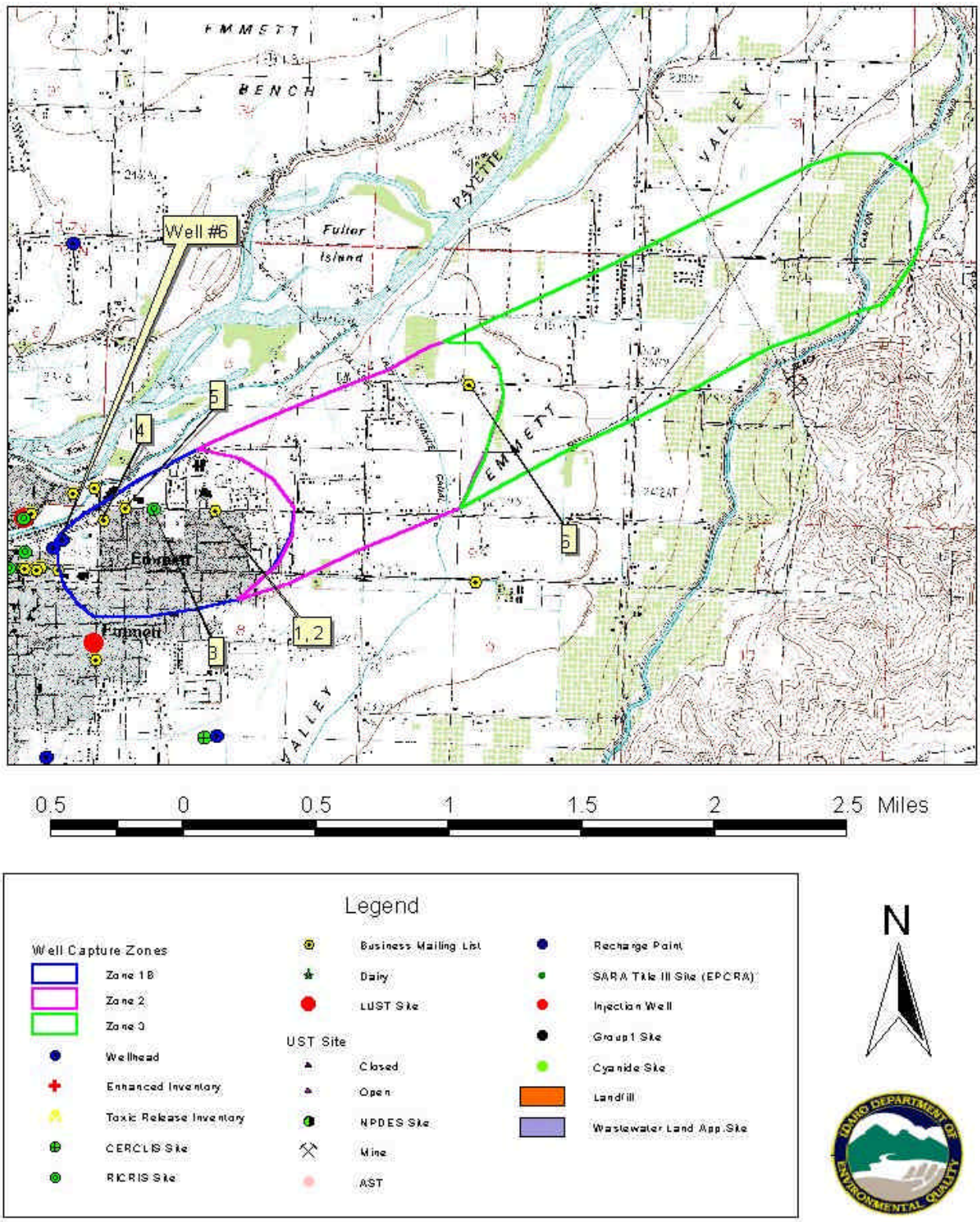


Figure 4. City of Emmett Well #8 Delineation and Potential Contaminant Locations

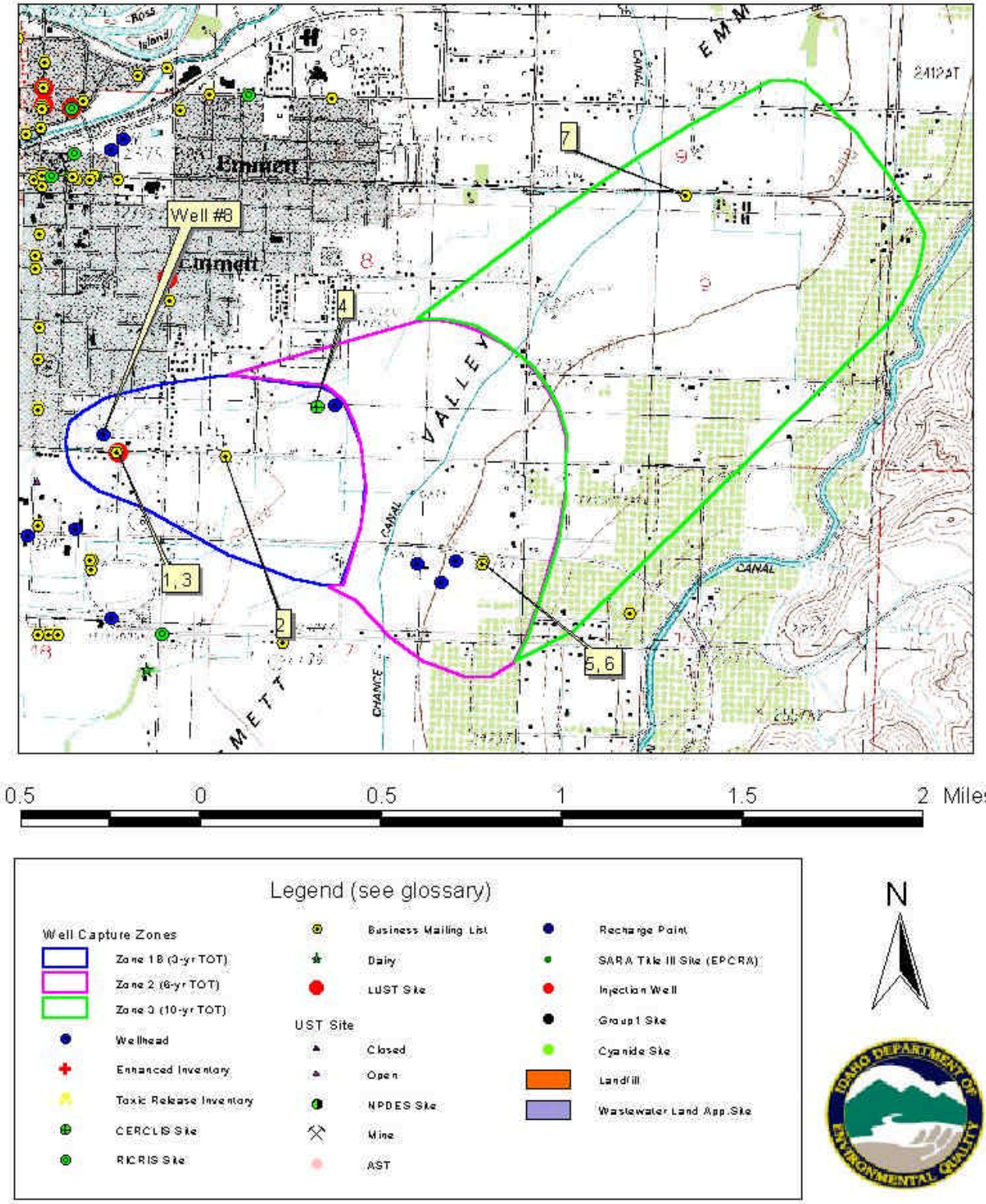
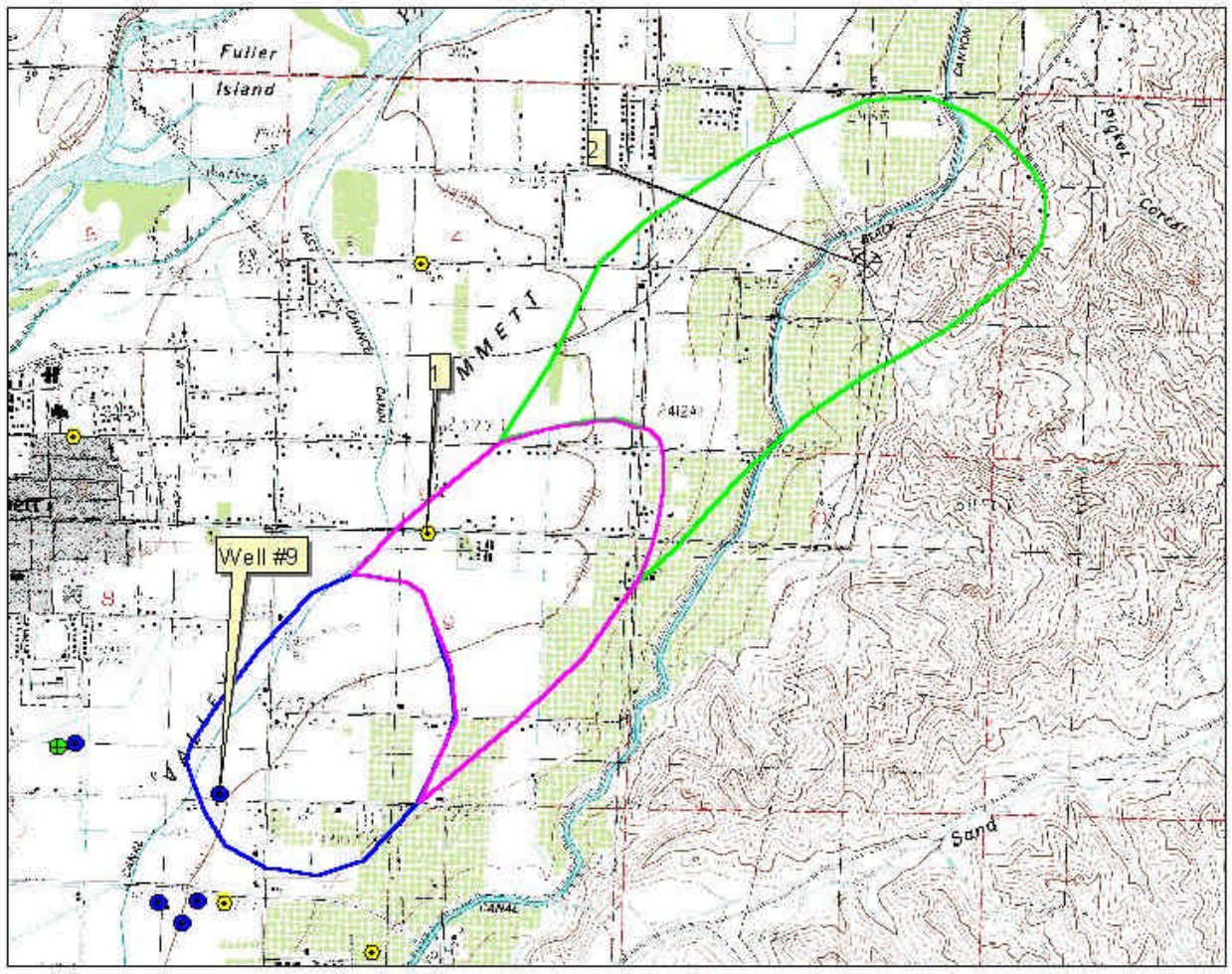


Figure 5. City of Emmett Well #9 Delineation and Potential Contaminant Locations



Section 3. Susceptibility Analyses

The water system's susceptibility to contamination was ranked as high, moderate, or low risk according to the following considerations: hydrologic characteristics, physical integrity of the well, land use characteristic, and potentially significant contaminant sources. The susceptibility rankings are specific to a particular potential contaminant or category of contaminants. Therefore, a high susceptibility rating relative to one potential contaminant does not mean that the water system is at the same risk for all other potential contaminants. The relative ranking that is derived for each well is a qualitative, screening-level step that, in many cases, uses generalized assumptions and best professional judgement. The following summaries describe the rationale for the susceptibility ranking.

Hydrologic Sensitivity

Hydrologic sensitivity was high for Wells #5 and #6 and moderate for Wells #8 and #9 (see Table 6). This reflects the nature of the soils being in the moderately-drained to well-drained class, the vadose zone (zone from land surface to the water table) being made predominantly of gravel, and the first groundwater being located within 20 feet of ground surface. Additionally, Wells #5 and #6 do not have a laterally extensive low permeability unit that could retard downward movement of contaminants. Wells #8 and #9 both have at least 50 feet cumulative thickness of low permeability units.

Well Construction

Well construction directly affects the ability of the well to protect the aquifer from contaminants. The City of Emmett drinking water system consists of four wells that extract groundwater for domestic, industrial, recreational, and commercial uses. The well system construction scores were moderate for the Wells #5, #6, and #8. Well #9 had a low construction score.

All four wells are having a new sanitary survey completed in October 2000, which will help determine if the wells are in compliance with wellhead and surface seal standards. All four wells have well houses, cement floors, and casing raised at least 18 inches above grade. Wells #5, #6, and #8 have a chlorine gas water treatment system. Well #9 is having a hypogeneration water treatment system installed. Well logs were available for Wells #6, #8, and #9, so a determination was made as to whether the casing and annular seals had been extended into low permeability units and whether current public water system (PWS) construction standards were being met.

Though Well #5 has no well log, some information was provided from a 1999 video log. The well has 8-inch casing from ground surface to 262 feet below ground surface (bgs). The water table was identified at 12 feet bgs. No well screen was installed. Significant rust has developed below 200 feet bgs. The borehole is bridged by a rock obstruction at 275 feet bgs.

The Well #6 log shows that the casing and annular seal do not extend into a low permeability unit. The well was drilled to 202 feet bgs. The water table was identified at 19 feet bgs. A well screen was installed from 157 feet bgs to 197 feet bgs. A surface seal was installed to a depth of 20 feet bgs. The well was gravel packed from land surface to 200 feet bgs. Blue sand was identified from 96 feet bgs to 156 feet bgs. Though the well may have been in compliance with standards when it was drilled in 1973, current PWS well construction standards are more stringent.

The Well #8 log shows that the casing and annular seal do not extend into a low permeability unit. The well was drilled to 319 feet bgs. The water table was identified at 12 feet bgs. Well screens were installed from 250 feet bgs to 275 feet bgs, and 285 feet bgs to 310 feet bgs. A surface seal was installed to a depth of 40 feet bgs. The well was gravel packed from 200 feet bgs to 319 feet bgs. A 21 foot thick section of blue clay was identified from 55 feet bgs to 76 feet bgs and a 30 foot thick sandstone section was identified from 102 feet bgs to 132 feet bgs. Though the well may have been in compliance with standards when it was drilled in 1986, current PWS well construction standards are more stringent.

The Idaho Department of Water Resources Well Construction Standards Rules (1993) require all PWSs to follow IDEQ standards as well. IDAPA 58.01.08.550 requires that PWSs follow the Recommended Standards for Water Works (1997) during construction. A portion of Table 1 of the Recommended Standards for Water Works (1997) is reproduced showing the required steel casing thickness and those that were used in constructing Wells #6, #8, and #9 (Table 5).

Table 5. Portion of Table 1 – Steel Casing thickness requirements.

Pipe diameter (in.)	Required thickness (in.)	Well #6 thickness	Well #8 thickness	Well #9 thickness
8	0.322	NA	NA	NA
10	0.365	NA	0.250	0.365
12	0.375	NA	0.250	NA
18	0.375	NA	0.375	0.375
24	0.500	0.375	NA	NA

The Well #9 log shows that the casing and annular seal do extend into a low permeability unit. The well was drilled to 535 feet bgs. The water table was identified at 18 feet bgs. Well screens were installed from 375 feet bgs to 410 feet bgs, and 420 feet bgs to 450 feet bgs. A surface seal was installed to a depth of 364 feet bgs into a blue clay layer. The well was gravel packed from 350 feet bgs to 525 feet bgs. Blue clay was encountered from 179 feet bgs to 190 feet bgs and from 330 feet bgs to 364 feet bgs. The well is in compliance with current construction standards.

The well logs obtained for the City of Emmett system show that the blue clay is encountered at various depths from as little as 55 feet bgs to about 180 feet bgs. All four wells are likely drawing from the deeper, confined aquifer below the blue clay layer. It is also possible that Wells #5 and #6 could be drawing water from the shallower, unconfined aquifer.

Potential Contaminant Source and Land Use

All four wells rated moderate for inorganic chemicals (IOCs) (ex. nitrate) and synthetic organic chemicals (SOCs) (ex. pesticides). The four wells rated low for microbial contaminants. Well #8 rated high and volatile organic chemicals (VOCs) (ex. petroleum products), while the other 3 wells rated moderate for VOCs. Commercial and industrial land uses in the delineated source area contributed the largest numbers of VOC and SOC points to the contaminant inventory rating. Agricultural land uses contributed the most points to the IOC contaminant inventory rating. The Payette River could potentially contribute microbial contaminants to Wells #5 and #6 if a pathway exists between the upper and lower aquifers.

From 1992 to 1998, total coliform bacteria were detected at the high school, the cemetery, and the E. Locust fire hydrant, but never at the wells. Nor have any other categories of contamination have been recorded in the well water.

Final Susceptibility Ranking

A detection above a drinking water standard Maximum Contaminant Level (MCL) or a detection of total coliform bacteria or fecal coliform bacteria at the wellhead will automatically give a high susceptibility rating to a well despite the land use of the area because a pathway for contamination already exists. Hydrologic sensitivity and system construction scores are heavily weighted in the final scores. Having multiple potential contaminant sources in the 0 to 3-year time of travel zone (Zone 1B) and much agricultural land contribute greatly to the overall ranking. In terms of total susceptibility, all four wells rate moderate for microbial contamination. Well #5 rates high for IOC, VOC, and SOC contaminants. Well #6 rates high for IOC contaminants and moderate for VOCs and SOCs. Wells #8 and #9 rate moderate for all categories.

Table 6. Summary of City of Emmett Susceptibility Evaluation

Well	Susceptibility Scores									
	Hydrologic Sensitivity	Contaminant Inventory				System Construction	**Final Susceptibility Ranking**			
		IOC	VOC	SOC	Microbials		IOC	VOC	SOC	Microbials
Well #5	H	M	M	M	L	M	H	H	H	M
Well #6	H	M	M	M	L	M	H	M	M	M
Well #8	M	M	H	M	L	M	M	M	M	M
Well #9	M	M	M	M	L	L	M	M	M	M

H = High Susceptibility, M = Moderate Susceptibility, Low Susceptibility
IOC = inorganic chemical, VOC = volatile organic chemical, SOC = synthetic organic chemical

Susceptibility Summary

Water chemistry data show that no type of contamination currently threatens the City of Emmett drinking water system. However, Well #5 shows a high susceptibility to IOC, VOC, and SOC contamination from nearby potential contaminant sources (Table 5), and Well #6 shows a high susceptibility to IOC contamination predominantly due to agricultural land uses.

The wells in the City of Emmett system takes their water in part from the deeper, confined to semi-confined lacustrine (lakebed deposited) aquifer. Wells #5 and #6 may take some of their water from the shallow, unconfined alluvial (river deposited material) aquifer. The shallow aquifer has been demonstrated to be a distinct water-bearing unit in terms of water quality, water yield, and the sources of recharge (IDEQ, 2000). The shallow aquifer contains much higher levels of nitrate, lower levels of iron, and higher levels of arsenic than the deeper aquifer. Water yields from the shallow aquifer are significantly higher than from the deeper aquifer. Groundwater in the shallow aquifer is recharged primarily from surface water irrigation, direct precipitation, and canal leakage while the sources of recharge to the deeper aquifer are indeterminate but are very likely much older.

Section 4. Options for Source Water Protection

The susceptibility assessment should be used as a basis for determining appropriate new protection measures or re-evaluating existing protection efforts. No matter what the susceptibility ranking a source receives, protection is always important. Whether the source is currently located in a "pristine" area or an area with numerous industrial and/or agricultural land uses that require education and surveillance, the way to ensure good water quality in the future is to act now to protect valuable water supply resources.

An effective source water protection program is tailored to the particular local source water protection area. A community with a fully developed source water protection program will incorporate many strategies. For the City of Emmett, source water protection activities should focus on implementation of practices aimed at reducing the leaching of agricultural chemicals from agricultural land within the designated source water areas. The City of Emmett should also be diligent about local businesses that are regulated by the various environmental regulations (RCRA, CERCLA, SARA) or those with potential inorganic contaminants. Most of the designated areas are outside the direct jurisdiction of the City of Emmett. Partnerships with state and local agencies and industry groups should be established and are critical to success. Disinfection practices should be maintained to reduce the risk of microbial contamination. Continued vigilance in keeping the well protected from surface flooding can also keep the potential for contamination reduced. Due to the time involved with the movement of groundwater, wellhead protection activities should be aimed at long-term management strategies even though these strategies may not yield results in the near term. Source water protection activities for agriculture should be coordinated with the Idaho Department of Agriculture, the Soil Conservation Commission and Gem Soil and Water Conservation District, and the Natural Resources Conservation Service.

Assistance

Public water supplies and others may call the following IDEQ offices with questions about this assessment and to request assistance with developing and implementing a local protection plan. In addition, draft protection plans may be submitted to the IDEQ office for preliminary review and comments.

Boise Regional IDEQ Office (208) 373-0550

State IDEQ Office (208) 373-0502

Website: http://www2.state.id.us/deq

Water suppliers serving fewer than 10,000 persons may contact John Bokor, Idaho Rural Water Association, at (208) 743-6142 for assistance with wellhead protection strategies.

POTENTIAL CONTAMINANT INVENTORY
LIST OF ACRONYMS AND DEFINITIONS

AST (Aboveground Storage Tanks) – Sites with aboveground storage tanks.

Business Mailing List – This list contains potential contaminant sites identified through a yellow pages database search of standard industry codes (SIC).

CERCLIS – This includes sites considered for listing under the **Comprehensive Environmental Response Compensation and Liability Act (CERCLA)**. CERCLA, more commonly known as ASuperfund≅ is designed to clean up hazardous waste sites that are on the national priority list (NPL).

Cyanide Site – DEQ permitted and known historical sites/facilities using cyanide.

Dairy – Sites included in the primary contaminant source inventory represent those facilities regulated by Idaho State Department of Agriculture (ISDA) and may range from a few head to several thousand head of milking cows.

Deep Injection Well – Injection wells regulated under the Idaho Department of Water Resources generally for the disposal of stormwater runoff or agricultural field drainage.

Enhanced Inventory – Enhanced inventory locations are potential contaminant source sites added by the water system. These can include new sites not captured during the primary contaminant inventory, or corrected locations for sites not properly located during the primary contaminant inventory. Enhanced inventory sites can also include miscellaneous sites added by the Idaho Department of Environmental Quality (IDEQ) during the primary contaminant inventory.

Floodplain – This is a coverage of the 100year floodplains.

Group 1 Sites – These are sites that show elevated levels of contaminants and are not within the priority one areas.

Inorganic Priority Area – Priority one areas where greater than 25% of the wells/springs show constituents higher than primary standards or other health standards.

Landfill – Areas of open and closed municipal and non-municipal landfills.

LUST (Leaking Underground Storage Tank) – Potential contaminant source sites associated with leaking underground storage tanks as regulated under RCRA.

Mines and Quarries – Mines and quarries permitted through the Idaho Department of Lands.)

Nitrate Priority Area – Area where greater than 25% of wells/springs show nitrate values above 5mg/l.

NPDES (National Pollutant Discharge Elimination System) – Sites with NPDES permits. The Clean Water Act requires that any discharge of a pollutant to waters of the United States from a point source must be authorized by an NPDES permit.

Organic Priority Areas – These are any areas where greater than 25 % of wells/springs show levels greater than 1% of the primary standard or other health standards.

Recharge Point – This includes active, proposed, and possible recharge sites on the Snake River Plain.

RICRIS – Site regulated under **Resource Conservation Recovery Act (RCRA)**. RCRA is commonly associated with the cradle to grave management approach for generation, storage, and disposal of hazardous wastes.

SARA Tier II (Superfund Amendments and Reauthorization Act Tier II Facilities) – These sites store certain types and amounts of hazardous materials and must be identified under the Community Right to Know Act.

Toxic Release Inventory (TRI) – The toxic release inventory list was developed as part of the Emergency Planning and Community Right to Know (Community Right to Know) Act passed in 1986. The Community Right to Know Act requires the reporting of any release of a chemical found on the TRI list.

UST (Underground Storage Tank) – Potential contaminant source sites associated with underground storage tanks regulated as regulated under RCRA.

Wastewater Land Applications Sites – These are areas where the land application of municipal or industrial wastewater is permitted by IDEQ.

Wellheads – These are drinking water well locations regulated under the Safe Drinking Water Act. They are not treated as potential contaminant sources.

NOTE: Many of the potential contaminant sources were located using a geocoding program where mailing addresses are used to locate a facility. Field verification of potential contaminant sources is an important element of an enhanced inventory.

Where possible, a list of potential contaminant sites unable to be located with geocoding will be provided to water systems to determine if the potential contaminant sources are located within the source water assessment area.

References Cited

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United States Geological Survey, 1986. Quality of Ground Water in the Payette River Basin, Idaho. United States Geological Survey. Water Resources Investigation Report 86-4013.

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Attachment A

City of Emmett
Susceptibility Analysis
Worksheet

The final scores for the susceptibility analysis were determined using the following formulas:

1) VOC/SOC/IOC Final Score = Hydrologic Sensitivity + System Construction + (Potential Contaminant/Land Use x 0.2)

2) 2) Microbial Final Score = Hydrologic Sensitivity + System Construction + (Potential Contaminant/Land Use x 0.35)

Final Susceptibility Scoring:

0 - 5 Low Susceptibility

6 - 12 Moderate Susceptibility

≥ 13 High Susceptibility

Ground Water Susceptibility Report Public Water System Name : EMMETT CITY OF Well# : WELL #5

Public Water System Number 3230012 09/07/2000 10:11:25 AM

1. System Construction		SCORE
Drill Date		
Driller Log Available	NO	
Sanitary Survey (if yes, indicate date of last survey)	YES	1990
Well meets IDWR construction standards	NO	1
Wellhead and surface seal maintained	NO	1
Casing and annular seal extend to low permeability unit	NO	2
Highest production 100 feet below static water level	YES	0
Well located outside the 100 year flood plain	YES	0
	Total System Construction Score	4

2. Hydrologic Sensitivity		
Soils are poorly to moderately drained	NO	2
Vadose zone composed of gravel, fractured rock or unknown	YES	1
Depth to first water > 300 feet	NO	1
Aquitard present with > 50 feet cumulative thickness	NO	2
	Total Hydrologic Score	6

3. Potential Contaminant / Land Use - ZONE 1A		IOC Score	VOC Score	SOC Score	Microbial Score
Land Use Zone 1A	IRRIGATED CROPLAND	2	2	2	2
Farm chemical use high	NO	0	0	0	
IOC, VOC, SOC, or Microbial sources in Zone 1A	NO	NO	NO	NO	NO
Total Potential Contaminant Source/Land Use Score - Zone 1A		2	2	2	2

Potential Contaminant / Land Use - ZONE 1B					
Contaminant sources present (Number of Sources)	YES	3	5	7	1
(Score = # Sources X 2) 8 Points Maximum		6	8	8	2
Sources of Class II or III leacheable contaminants or	YES	0	3	1	
4 Points Maximum		0	3	1	
Zone 1B contains or intercepts a Group 1 Area	NO	0	0	0	0
Land use Zone 1B	Less Than 25% Agricultural Land	0	0	0	0
Total Potential Contaminant Source / Land Use Score - Zone 1B		6	11	9	2

Potential Contaminant / Land Use - ZONE II					
Contaminant Sources Present	YES	2	0	0	
Sources of Class II or III leacheable contaminants or	YES	1	0	0	
Land Use Zone II	Greater Than 50% Irrigated Agricultural Land	2	2	2	
Potential Contaminant Source / Land Use Score - Zone II		5	2	2	0

Potential Contaminant / Land Use - ZONE III					
Contaminant Source Present	YES	1	0	0	
Sources of Class II or III leacheable contaminants or	YES	1	0	0	
Is there irrigated agricultural lands that occupy > 50% of	YES	1	1	1	

Total Potential Contaminant Source / Land Use Score - Zone III	3	1	1	0
Cumulative Potential Contaminant / Land Use Score	16	16	14	4
4. Final Susceptibility Source Score	13	13	13	12
5. Final Well Ranking	High	High	High	Moderate

Ground Water Susceptibility Report Public Water System Name : EMMETT CITY OF Well# : WELL #6

Public Water System Number 3230012 09/07/2000 10:11:38 AM

1. System Construction		SCORE				
Drill Date	04/30/1973					
Driller Log Available	YES					
Sanitary Survey (if yes, indicate date of last survey)	YES	1990				
Well meets IDWR construction standards	NO	1				
Wellhead and surface seal maintained	NO	1				
Casing and annular seal extend to low permeability unit	NO	2				
Highest production 100 feet below static water level	YES	0				
Well located outside the 100 year flood plain	YES	0				
	Total System Construction Score	4				
2. Hydrologic Sensitivity						
Soils are poorly to moderately drained	NO	2				
Vadose zone composed of gravel, fractured rock or unknown	YES	1				
Depth to first water > 300 feet	NO	1				
Aquitard present with > 50 feet cumulative thickness	NO	2				
	Total Hydrologic Score	6				
3. Potential Contaminant / Land Use - ZONE 1A		IOC Score	VOC Score	SOC Score	Microbial Score	
Land Use Zone 1A	IRRIGATED CROPLAND	2	2	2	2	
Farm chemical use high	NO	0	0	0		
IOC, VOC, SOC, or Microbial sources in Zone 1A	NO	NO	NO	NO	NO	
	Total Potential Contaminant Source/Land Use Score - Zone 1A	2	2	2	2	
Potential Contaminant / Land Use - ZONE 1B						
Contaminant sources present (Number of Sources)	YES	4	2	3	1	
(Score = # Sources X 2) 8 Points Maximum		8	4	6	2	
Sources of Class II or III leacheable contaminants or	YES	1	1	1		
4 Points Maximum		1	1	1		
Zone 1B contains or intercepts a Group 1 Area	NO	0	0	0	0	
Land use Zone 1B	Less Than 25% Agricultural Land	0	0	0	0	
	Total Potential Contaminant Source / Land Use Score - Zone 1B	9	5	7	2	
Potential Contaminant / Land Use - ZONE II						
Contaminant Sources Present	YES	2	0	0		
Sources of Class II or III leacheable contaminants or	YES	1	0	0		
Land Use Zone II	Greater Than 50% Irrigated Agricultural Land	2	2	2		
	Potential Contaminant Source / Land Use Score - Zone II	5	2	2	0	
Potential Contaminant / Land Use - ZONE III						
Contaminant Source Present	NO	0	0	0		
Sources of Class II or III leacheable contaminants or	YES	1	0	0		
Is there irrigated agricultural lands that occupy > 50% of	YES	1	1	1		
	Total Potential Contaminant Source / Land Use Score - Zone III	2	1	1	0	

Cumulative Potential Contaminant / Land Use Score	18	10	12	4
4. Final Susceptibility Source Score	14	12	12	12
5. Final Well Ranking	High	Moderate	Moderate	Moderate

Ground Water Susceptibility Report Public Water System Name : EMMETT CITY OF Well# : WELL #8

Public Water System Number 3230012 09/07/2000 10:11:52 AM

1. System Construction		SCORE				
Drill Date	01/15/1986					
Driller Log Available	YES					
Sanitary Survey (if yes, indicate date of last survey)	YES	1990				
Well meets IDWR construction standards	NO	1				
Wellhead and surface seal maintained	NO	1				
Casing and annular seal extend to low permeability unit	NO	2				
Highest production 100 feet below static water level	YES	0				
Well located outside the 100 year flood plain	YES	0				
	Total System Construction Score	4				

2. Hydrologic Sensitivity						
Soils are poorly to moderately drained	NO	2				
Vadose zone composed of gravel, fractured rock or unknown	YES	1				
Depth to first water > 300 feet	NO	1				
Aquitard present with > 50 feet cumulative thickness	YES	0				
	Total Hydrologic Score	4				

3. Potential Contaminant / Land Use - ZONE 1A		IOC Score	VOC Score	SOC Score	Microbial Score
Land Use Zone 1A	IRRIGATED CROPLAND	2	2	2	2
Farm chemical use high	NO	0	0	0	
IOC, VOC, SOC, or Microbial sources in Zone 1A	NO	NO	NO	NO	NO
Total Potential Contaminant Source/Land Use Score - Zone 1A		2	2	2	2
Potential Contaminant / Land Use - ZONE 1B					
Contaminant sources present (Number of Sources)	YES	2	4	4	0
(Score = # Sources X 2) 8 Points Maximum		4	8	8	0
Sources of Class II or III leacheable contaminants or	YES	4	2	0	
4 Points Maximum		4	2	0	
Zone 1B contains or intercepts a Group 1 Area	NO	0	0	0	0
Land use Zone 1B	Greater Than 50% Irrigated Agricultural Land	4	4	4	4
Total Potential Contaminant Source / Land Use Score - Zone 1B		12	14	12	4
Potential Contaminant / Land Use - ZONE II					
Contaminant Sources Present	YES	0	2	2	
Sources of Class II or III leacheable contaminants or	YES	1	0	0	
Land Use Zone II	Greater Than 50% Irrigated Agricultural Land	2	2	2	
Potential Contaminant Source / Land Use Score - Zone II		3	4	4	0
Potential Contaminant / Land Use - ZONE III					
Contaminant Source Present	YES	1	1	1	
Sources of Class II or III leacheable contaminants or	YES	1	0	0	
Is there irrigated agricultural lands that occupy > 50% of	YES	1	1	1	
Total Potential Contaminant Source / Land Use Score - Zone III		3	2	2	0

Cumulative Potential Contaminant / Land Use Score	20	22	20	6
4. Final Susceptibility Source Score	12	12	12	10
5. Final Well Ranking	Moderate	Moderate	Moderate	Moderate

Ground Water Susceptibility Report Public Water System Name : EMMETT CITY OF Well# : WELL #9

Public Water System Number 3230012 09/07/2000 10:12:06 AM

1. System Construction		SCORE				
Drill Date	09/19/1999					
Driller Log Available	YES					
Sanitary Survey (if yes, indicate date of last survey)	NO	0				
Well meets IDWR construction standards	YES	0				
Wellhead and surface seal maintained	NO	1				
Casing and annular seal extend to low permeability unit	YES	0				
Highest production 100 feet below static water level	YES	0				
Well located outside the 100 year flood plain	YES	0				
	Total System Construction Score	1				
2. Hydrologic Sensitivity						
Soils are poorly to moderately drained	NO	2				
Vadose zone composed of gravel, fractured rock or unknown	YES	1				
Depth to first water > 300 feet	NO	1				
Aquitard present with > 50 feet cumulative thickness	YES	0				
	Total Hydrologic Score	4				
3. Potential Contaminant / Land Use - ZONE 1A		IOC Score	VOC Score	SOC Score	Microbial Score	
Land Use Zone 1A	IRRIGATED CROPLAND	2	2	2	2	
Farm chemical use high	NO	0	0	0		
IOC, VOC, SOC, or Microbial sources in Zone 1A	NO	NO	NO	NO	NO	
	Total Potential Contaminant Source/Land Use Score - Zone 1A	2	2	2	2	
Potential Contaminant / Land Use - ZONE 1B						
Contaminant sources present (Number of Sources)	NO	0	0	0	0	
(Score = # Sources X 2) 8 Points Maximum		0	0	0	0	
Sources of Class II or III leacheable contaminants or	YES	4	0	0		
4 Points Maximum		4	0	0		
Zone 1B contains or intercepts a Group 1 Area	NO	0	0	0	0	
Land use Zone 1B	Greater Than 50% Irrigated Agricultural Land	4	4	4	4	
	Total Potential Contaminant Source / Land Use Score - Zone 1B	8	4	4	4	
Potential Contaminant / Land Use - ZONE II						
Contaminant Sources Present	YES	2	2	2		
Sources of Class II or III leacheable contaminants or	YES	1	0	0		
Land Use Zone II	Greater Than 50% Irrigated Agricultural Land	2	2	2		
	Potential Contaminant Source / Land Use Score - Zone II	5	4	4	0	
Potential Contaminant / Land Use - ZONE III						
Contaminant Source Present	YES	1	0	0		
Sources of Class II or III leacheable contaminants or	YES	1	0	0		
Is there irrigated agricultural lands that occupy > 50% of	YES	1	1	1		
	Total Potential Contaminant Source / Land Use Score - Zone III	3	1	1	0	

Cumulative Potential Contaminant / Land Use Score	18	11	11	6
4. Final Susceptibility Source Score	9	7	7	7
5. Final Well Ranking	Moderate	Moderate	Moderate	Moderate